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## CIRM grantees begin testing stem cells to prevent amputations

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CIRM grantees at UC Davis have begun a trial that, if successful, could help prevent some amputations caused by blockages in the blood vessels.

Jan Nolta, who is director of the UC Davis Stem Cell Program and Institute for Regenerative Cures, came to CIRM offices last year and spoke about the animal studies that led up to this trial. The Davis team harvested a form of stem cells called mononuclear stem cells from the bone marrow - these are different than the blood-forming stem cells that recreate the blood system in a bone marrow transplant. Instead, these cells form blood vessels and other tissues.

In the data Nolta showed us, the mononuclear stem cells injected into the legs of animals with induced blood vessel blockages were able to restore circulation in those limbs. If the cells work as effectively in people as in the animals studies, they could unblock the arteries and save the people from possible amputation.

A story in the Daily Democrat quotes Jan Nolta:

“Our own research in mice has shown that adult human stem cells are very efficient at targeting areas of low oxygen and promoting the formation of new blood vessels. This next stage of our research will determine if the treatment truly offers hope for people without other options and who are at risk of losing a limb.”

That same story has a good description of how the blockages form:

“An estimated 85,000 leg amputations are performed each year in the U.S. due to advanced atherosclerosis -- also known as critical limb ischemia -- which occurs when the buildup of fatty deposits, calcium and plaque in arteries greatly reduces blood flow to lower extremities. Current treatments for the condition include opening blockages with balloon angioplasty, bolstering weakened arteries with metal stents or bypassing damaged arteries with vein grafts. When the disease progresses to the point of limb-threatening ischemia and when angioplasty, stents or surgery are not viable, amputation becomes the only option.

CIRM doesn't fund the research that led to this study, but we did help fund the sterile Good Manufacturing Practice lab where the team manufactures the cells that they'll use in the study. We did a video about that state-of-the-art facility right before it opened. With their own GMP lab, Davis scientists are able to manufacture cells that pass muster with the US. Food and Drug Administration, who has to approve all cells used in clinical trials.

As is always the case with preliminary human trials, it's too soon to know whether or not the technique will work. More initial trials fail than succeed. We'll be watching for news out of Davis over the next years to see how the technique fares in this and in subsequent trials.

- A.A.

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